
PHASE I AFTER ACTION REPORT

BORIT ASBESTOS SITE AMBLER, PENNSYLVANIA

Prepared for:

**United States Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103**

Prepared by:

**Tetra Tech EM, Inc.
7 Creek Parkway
Suite 700
Boothwyn, PA 19061**

**BoRit Asbestos Site
www.epaosc.net/BoRit**



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FOREWORD

As mandated by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the *Code of Federal Regulations* (CFR), Part 300, the U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) is required to provide coordinated federal response capabilities at the scene of an unplanned or sudden release of oil or hazardous substance that poses a threat to public welfare or the environment. In addition, the provisions of Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), promote a coordinated federal, state, and local response to situations whenever any hazardous substance is released or there is a substantial threat of such a release into the environment.

Conditions at the BoRit Asbestos Site presented a substantial threat to human health and the environment because of the potential of an uncontrolled release of a hazardous substance (asbestos) to the environment, thereby providing a legal basis for federal response activities. EPA Region III of Philadelphia, Pennsylvania implemented the provisions of the NCP, Section 300.415.

The OSC would like to thank all agencies and individuals who provided their assistance and expertise to ensure the successful completion of Phase I activities.

Eduardo Rovira, Jr.
On-Scene Coordinator
EPA Region III
Philadelphia, Pennsylvania

FACT SHEET

REGION III
REMOVAL ACTION

TDD No. E33-020-08-07-018

SITE:	BoRit Asbestos Site
SIZE:	The site consists of an asbestos pile area (~ 6 acres), reservoir area (~15 acres), and park area (~11 acres), totaling about 32 acres. The site also contains portions of three streams: Wissahickon and Rose Valley Creeks, and Tannery Run.
LOCATION:	Ambler, Montgomery County, Pennsylvania
APPROVAL DATES:	Original Funding Request: August 14, 2006 (POLREP #1) Increase in Funding Request: April 14, 2008 (Action Memo)
PHASE I DATES:	July 7, 2008 – June 30, 2009 (Phase I)
DESCRIPTION:	Under Phase I activities, approximately 8,400 square yards of park area were cleared and approximately 2,000 yards of approach roads were constructed. Once the site was cleared and the approach roads were constructed, erosion and sedimentation control measures activities were initiated for the east bank of the Wissahickon Creek (adjacent to the park). Those activities included the preparation of the slope, laying down geotextile fabric, Geocells installation, infilling of geocells with stone and/or topsoil, placement of rip-rap along the water's edge, hydroseeding of the slope, and placement of an erosion control mat over the seeded area.
NATIONAL PRIORITIES LIST STATUS:	The site was proposed for the National Priority List (NPL) on September 3, 2008 and was listed on the NPL on April 8, 2009.
HAZARDOUS MATERIALS:	Asbestos-containing material (ACM) waste.
QUANTITIES REMOVED:	There were a lot of ACM pieces (e.g., pipes, shingles, and tiles) along the Phase I slope. During the preparation stages of the slope, the bulk (big pieces) of the ACM debris was collected and put into roll-off containers for off-site disposal (approximately 476 tons of materials).
ON-SCENE COORDINATOR:	Eduardo Rovira, Jr.
REMOVAL CONTRACTOR:	WRScompass
DISPOSAL LOCATION:	Modern Landfill, York, Pennsylvania.
PHASE I COST:	\$3,187,790.49
SITE INFORMATION:	For additional information, please visit the site's website at www.epaosc.net/BoRit .

1.0 INTRODUCTION

This report discusses Phase I activities at the BoRit Asbestos Site (BoRit) in Ambler, Montgomery County, Pennsylvania, from July 7, 2008 through June 30, 2009. This report includes site background information (Section 2.0); a roster of agencies, organizations, and individuals involved with Phase I activities (Section 3.0); resources committed (Section 4.0); Phase I design and activities (Section 5.0); challenges encountered (Section 6.0); a glossary of acronyms used (Section 7); and a reference section (Section 8.0).

2.0 SITE BACKGROUND

The BoRit site consists of three adjacent properties: a property on which a pile of asbestos-containing material (ACM) is located (pile area), a property on which a water reservoir is located (reservoir area), and a park where disposal of ACM occurred (park area). The site also contains portions of three tributaries: the Wissahickon and Rose Valley Creeks and Tannery Run.

2.1 SITE LOCATION

The site is located on the northwest corner of the intersection of West Butler Pike and West Maple Street behind a McDonald's restaurant in Ambler, Montgomery County, Pennsylvania. The asbestos pile area and Tannery Run are within the Borough of Ambler limits, the reservoir area is considered to be in Upper Dublin Township, and the park area is located in Whitpain Township. The geographic coordinates at the approximate center of the park area are 40.1561 north latitude and 75.2306 west longitude.

The site is bordered to the north by residential properties; to the northeast and east by Chestnut Avenue, West Maple Street, and commercial and residential areas; to the south by commercial properties (McDonald's, Classic Coachwork, and Sons of Italy); to the southwest by open space owned by Montgomery County and the Pennsylvania Department of Transportation (PennDOT); and to the northwest by residential properties. A playground, Westside Tiny Tot Park, and Westside Park (basketball courts) are located to the northeast and north, respectively. See Appendix A for a Site Location Map (Figure 1) and a Site Layout Map (Figure 2).

The Ambler Asbestos Site, a former NPL site, is located approximately 1,000 feet southeast from the pile area of the BoRit site. The NPL site was used as a disposal area by the Keasbey and Mattison Company (KMC) plant located within close proximity of the Ambler Asbestos NPL site. The EPA performed a cleanup action at the site in the early 1990s and it was removed from the NPL in December 1996.

The Wissahickon Creek borders the site to the southwest. The approximate length of the Wissahickon Creek from the northwest corner of the site (close to Mt. Pleasant Avenue) to the confluence of Rose Valley Creek is 1,550 feet, and from Rose Valley Creek to the confluence of Tannery Run is 890 feet. One dam, in a deteriorated condition, exists on Wissahickon Creek approximately 200 feet upstream from the confluence of Tannery Run. The total length of the Wissahickon Creek under consideration is about 2,440 feet. Based on data collected on June 10, 2008 by EPA and Tetra Tech EM, Inc. (Tetra Tech), the average width of the creek is 50 feet, and the average velocity under normal conditions is 1.26 feet per second. U.S. Geological Survey (USGS) stream flow measurements collected in December 2003, at the Fort Washington station, during a flood occurrence reflected a creek width of 76 feet, a cross-section area of 652 square feet, a velocity of 5.48 feet per second, and the water height at the station gauge of 10.66 feet. Additionally, Federal Emergency Management Agency (FEMA) study information reflects a velocity measurement of 7.2 to 8 feet per second for a 100-year flood stage. Based on the information collected from these three sources, the velocity of the Wissahickon Creek can vary from an average velocity of 1.26 feet per second to as much as 10 feet per second, or higher, during a major storm event.

Rose Valley Creek is located in between the reservoir and the park area. The approximate length of Rose Valley Creek from Chestnut Avenue to the confluence of Wissahickon Creek is 770 feet. Based on data collected on June 10, 2008, the average width of the creek is 15 feet and average velocity during normal conditions is 1.2 feet per second; however, in case of a major storm event, the velocity will be more than double what it is under normal conditions.

Tannery Run borders the BoRit site to the east and flows to the south/southeast of the pile area. A commercial area (McDonald's, Classic Coachwork, and Sons of Italy) is located south of Tannery Run. The approximate length of Tannery Run under consideration is 720 feet and the

average width of the creek is 13 feet. However, in one location (behind the Sons of Italy parking lot), the width of the creek is 24 feet. As measured on June 10, 2008, the average velocity of the creek is 1.3 feet per second. However, it is anticipated that in the case of a storm event, the velocity will be more than double what it is under normal conditions. The creek flows over bedrock in a general east to west direction. The approximate elevation difference between the two ends of the creek adjacent to the site is 10 feet. The bedrock drops about 4 feet in the area behind Classic Coachwork. Close to the McDonald's parking lot, the south bank of Tannery Run is approximately 10 feet high. Behind the Sons of Italy parking lot, the south bank is approximately 20 feet high.

2.2 SITE HISTORY

KMC began manufacturing asbestos products in the Borough of Ambler in the late 1800s until the facility was sold to Nicolet, Inc. and CertainTeed Corporation in the early 1960s. Both Nicolet, Inc. and CertainTeed Corporation continued to manufacture ACM. Asbestos waste from the manufacturing process was dumped in the areas described below.

2.2.1 Pile Area

The pile area is a 6 acre parcel located at the northwest corner of West Maple Street and Tannery Run. ACM waste from the KMC facility was disposed of at the parcel, which created the asbestos pile that is approximately 20 to 25 feet above the surrounding ground surface.

Comparison of aerial photographs from different years suggests that KMC began disposing waste at the pile portion of the BoRit site during the 1930s. Asbestos waste disposal appears to have continued until the 1960s. Reportedly, this area primarily received slurry of spent magnesium and calcium carbonate as well as waste products from the manufacturing of asbestos pipe, insulation, sound dampeners and ceiling/roof tile. The berms around the pile appear to have been constructed of asbestos shingles and soil. Based on aerial photographs, between 1970 and 1973, the pile was covered with vegetation. The site was first fenced in the mid-1980s. For short periods of time in the 1980s and 1990s, portions of the pile area were used as a trash transfer station or trash storage location and for fire fighting training. During this period, the pile appears to have been vegetated. Asbestos waste is visible on the surface in several locations. A

two-dimensional electrical survey estimated the volume of the pile to be 149,500 cubic yards (Gilmore & Associates 2001).

2.2.2 Reservoir Area

The 15-acre reservoir area, located north/northwest of the pile, was used by the KMC plant for the storage of process and fire water. Water from the reservoir was carried to the plant through a metallic pipe, which is still visible in Tannery Run (behind the McDonald's). The banks of the reservoir are suspected to be constructed of ACM waste (asbestos shingles, millboard, and soil) from the KMC plant.

The reservoir is present in a 1937 aerial photograph and likely was in place before this date. ACM waste may lie on portions of the reservoir bottom. The Wissahickon Valley Waterfowl Preserve (WVWP), a local conservation group, wants to keep the reservoir as a natural habitat and is planning a viewing platform along West Maple Street for the general public to enjoy the fauna.

2.2.3 Park Area

The Whitpain Wissahickon Park (park area), located northwest of the existing reservoir property, also received ACM waste from the KMC plant. The 11-acre park is triangular in shape.

The park area reportedly received out-of-specification asbestos manufacturing products and other solid wastes. It is not clear when disposal activities began in this area. However, aerial photos indicate disposal may have started as early as 1937. Aerial photographs suggest that waste disposal ceased in the mid 1960s when the pile was covered with soil. A 1970 aerial photograph shows a baseball diamond in the park. The park has been officially closed for public access for more than 20 years. The local community and other interested parties would like to see the park reopened for public use.

2.3 PREVIOUS SITE INVESTIGATIONS AND ACTIVITIES

This section describes previous site investigations and activities performed at the pile area, the reservoir area, and the park area of the BoRit site, and in the portions of the three tributaries contained within the BoRit site (Wissahickon and Rose Valley Creeks, and Tannery Run).

2.3.1 Asbestos Pile Area

In 1984, the Pennsylvania Department of Environmental Protection (PADEP – previously known as the Pennsylvania Department of Environmental Resources [PADER]) collected samples from the pile portion of the BoRit site; all samples contained asbestos. PADEP issued a notice of violation to Nicolet, owner of the pile property at the time, for not complying with the asbestos waste disposal regulations. In 1984, the pile was determined by PADEP to be inadequately covered, and no warning signs were posted on the property. PADEP directed Nicolet to either cover the pile with 6 inches of compacted material (clay/soil) and vegetation or cover it with 2 feet of compacted material; to post warning signs; and to construct a fence around the pile. In response to these directives, Nicolet constructed a fence along the eastern portion of the property along West Maple Street to control access. Available information does not indicate whether the pile was covered at the time or signs were posted.

On March 30, 1984, EPA's contractor, the NUS Field Investigation Team (FIT) 3, conducted a preliminary assessment of the pile portion of the BoRit site. A small trash transfer station was located on the property, and the asbestos pile was covered with vegetation (NUS 1984).

On October 27, 1987, NUS FIT 3 conducted a site investigation (SI) of the pile area. Seven soil samples were collected from the pile and surrounding areas, three water samples were collected from Tannery Run, and two water samples were collected from the Wissahickon Creek. The soil samples contained up to 22 percent total asbestos. The water samples results ranged from non-detect to 2.5 million fibers per liter (NUS 1988). The maximum contaminant level (MCL) for asbestos in drinking water is 7.0 million fibers per liter.

Observations made during the 1987 SI indicated that individuals were accessing the pile area for unauthorized disposal of household wastes. In addition, although about 95 percent of the pile area was covered with heavy vegetation, there were small areas with no vegetation and six

abandoned vehicles were located on-site. Runoff from the pile area entered Tannery Run. The pile measured 2 acres in areal extent and the height of the pile was approximately 25 feet above the surrounding grade. Four empty 55-gallon drums were located in the reservoir north of the pile, and asbestos shingles were observed on the ground throughout the property (NUS 1988). It was not clear from the report whether the drums were floating or were stuck at the bottom of the reservoir.

In April 2006, an EPA Site Assessment Group conducted a baseline sampling event at the site. Results from the sampling event showed the presence of asbestos in air, soil, surface water, and sediments. ACM were visible throughout the entire site (Tetra Tech 2006).

2.3.2 Reservoir Area

In June 2004, a Phase I Environmental Site Assessment (ESA) was conducted by O'Brien & Gere, for the Wissahickon Valley Watershed Association (WVWA), in the 15-acre water reservoir area. The ESA identified non-friable ACM along the banks of the water reservoir, which were constructed of asbestos shingles, millboard and soil. ACM was also observed within the reservoir. Asbestos-containing cement pipe sections and various other types of ACM were scattered around the banks of the reservoir and along Rose Valley and Wissahickon Creeks. ACM observed near the reservoir consisted of transite, a mixture of cement and asbestos. These materials are generally non-friable; however, it was observed that the transite was beginning to degrade and become friable at the weathered ends of the material (O'Brien & Gere 2004).

The Phase I ESA included the collection of reservoir water, sediment, waste, soil and air samples. The reservoir water and sediment samples were analyzed for metals, volatile organic compounds (VOC), and semi-volatile organic compounds (SVOC). The samples were not analyzed for asbestos. No significant concentrations of contaminants were detected in the samples. Gray-white soil or soil-like material in 5 to 10 square foot patches was observed on the east side of the reservoir. One sample of this material was collected and analysis showed 30 percent chrysotile asbestos. The same gray-white material was observed below the vegetation around the reservoir. Three samples of this material were collected and contained 20 to 25 percent chrysotile asbestos. Two air samples from downwind of the reservoir were collected during a period of 2.5 hours. The air samples were analyzed using phase contrast microscopy

(PCM) and contained 0.0004 asbestos fibers per cubic centimeter (O'Brien & Gere 2004). Although PCM method of analysis is not generally used when evaluating public exposure to airborne asbestos, this value is below the Occupational Safety and Health Administration's (OSHA) permissible exposure limit (0.1 fibers per milliliter – 8 hour TWA), below EPA's limit for schools after indoor asbestos remediation (0.01 fibers per cubic centimeter), and within the range of reported airborne asbestos PCM values for urban areas (10^{-8} to 10^{-4} fibers per milliliter – levels in urban areas may be an order of magnitude higher than those in rural areas). (Agency for Toxic Substances and Disease Registry [ATSDR] 2001).

It should be noted that the preferred method for analyzing air samples for asbestos for human health risk assessment purposes is transmission electron microscopy (TEM). PCM cannot detect fibers below 0.20 to 0.30 micrometer (μm) in diameter, but TEM is capable of detecting fibers with a diameter as small as 0.01 μm ; therefore, the PCM method may underestimate the actual asbestos concentration.

In March 2005, three surface soil samples were collected from beneath a pole-mounted transformer located near the southern corner of the water reservoir and analyzed for polychlorinated biphenyls (PCBs). No PCBs were detected. In addition, three surface soil samples were collected near a discarded metal storage tank and analyzed for polynuclear aromatic hydrocarbons (PAH). The soil samples contained the following PAHs: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene. Levels found did not pose a threat to human health and/or the environment. The detected compounds are common components of heating oil and petroleum-based products and may be formed by incomplete combustion of some fuels. Three sediment samples were collected from the bottom of the reservoir and analyzed for asbestos, and one sediment sample was collected from the outflow of the reservoir and analyzed for asbestos. Asbestos was not detected in any of the four sediment samples (Tetra Tech 2006).

2.3.3 Park Area

In response to public concerns, EPA's Removal Program collected two soil samples from the park area in December 1983. Results for both samples revealed chrysotile asbestos ranging from

10 to 15 percent. EPA collected 24 surface soil samples from the park and three soil samples from areas adjacent to the park in October 1984. Out of the 24 samples, 5 contained approximately one percent chrysotile asbestos and one contained less than one percent. One of the three off-site samples contained one percent asbestos. No asbestos fibers were observed in the other 20 samples (Tetra Tech 2006).

In December 1984, EPA collected seven on-site vacuum samples from the park surface. No asbestos fibers were detected using PCM analyses. In addition, soil core, surface soil and vacuum samples were collected from seven nearby yards and roads adjacent to the yards. For comparison, two background samples from Fort Washington State Park were collected. Chrysotile asbestos fibers were found (using TEM analyses) in several of the samples from both the nearby yards and Fort Washington Park locations. Public health officials concluded that the asbestos levels present in the yards could not be differentiated from background area locations (Tetra Tech 2006).

In July 1996, EPA and PADEP collected 96 soil samples, including both surface and subsurface samples (down to 14 inches below ground surface) from the park. Results revealed asbestos in all but six samples (using PCM and TEM analyses). Amosite asbestos was detected in six samples and chrysotile in 86 samples. Asbestos concentrations ranged from trace to 15 percent. Generally, the higher percentage values were found at depth.

2.3.4 Removal and Site Assessments

On April 20 and 27, 2006, Tetra Tech collected air, soil, surface water, sediment, and waste samples from the site. Only two soil samples were collected from the park. The results for both samples indicated that the soil from the park area contained asbestos. The trip report for the April 2006 sampling event indicated that all air samples contained detectable asbestos fibers; however, the analytical data as presented did not allow for a reliable determination of health risks or comparison to a health-based standard for asbestos.

Four of the six air samples were found to be overloaded with dust/particles. The analytical technique used to analyze such samples is not the preferred method when the results will be used

to perform risk analyses. Values ranged from 0.00061 f/cc to 0.039 f/cc. The higher values were significantly above “typical” background levels for urban areas (0.0001 f/cc) and approached the occupational permissible exposure limit (PEL).

Asbestos fibers were detected in five surface soil samples and four waste samples collected from the pile and park areas. Asbestos fibers were also detected in both the upstream and downstream sediment samples collected from Wissahickon Creek. Asbestos fibers were not detected in the surface water samples collected from Wissahickon Creek but were detected in one of the surface water samples collected from the reservoir (Tetra Tech 2006). Results prompted referral to EPA’s Removal Program.

From October 2006 to September 2007, EPA’s Removal Program collected a total of eight rounds of air samples at and around the Site. Approximately 382 samples were collected and analyzed by TEM. Some of those rounds included activity-based sampling (ABS). During ABS, personnel wore personal air sampling pumps while conducting physical activities such as soil sample collection, hiking, brush cutting and raking. The air samples were collected and analyzed using methods recommended by the EPA Asbestos Technical Review Workgroup (TRW). The detection limits set were 0.0005 f/cc for stationary pumps and 0.003 f/cc for personal pumps.

Asbestos fibers were counted by several means. However, when using the Phase Contrast Microscopy Equivalency (PCME – used to determine airborne health risk) method of counting asbestos fibers, only one off-site sampling location resulted in a detection (May 2007). The sample station was located on an industrial facility property and the result was 0.00049 f/cc. Stationary samplers located at the perimeter of the Site or on-site resulted in six positive PCME results ranging from 0.00048 to 0.00098 f/cc. The highest result was recorded at a station in the park in September 2007, the driest month during the sampling period. The ABS raking scenarios on both the pile and park resulted in personal air sampler concentrations of 0.021, 0.012 and 0.0058 f/cc by PCME; the highest result was found for a sample collected when raking along the Wissahickon Creek bank adjacent to the park.

In total, of the approximate 382 samples collected, there were ten detections by PCME; one at an off-site stationary sample location (0.00049 f/cc), six at on-site or perimeter stationary locations

(0.00048 to 0.00098 f/cc) and three ABS samples (0.0058 to 0.021 f/cc). Some of the ABS results are well above 0.0009 f/cc (PCME), which was the number calculated to present a 1×10^{-4} cancer risk at the World Trade Center.

Only the PCME results are routinely used by EPA to determine airborne health risks. Nonetheless, it is recognized that the shorter fibers captured by the AHERA counting method may play a role in increased potential for non-cancer health effects (i.e. pulmonary fibrosis). Of the 382 samples, there were 75 detections using the AHERA (fiber length ≥ 0.5 microns) counting method, the majority at or near the analytical detection limit. Out of the 75 detections, 18 were off-site (<0.0005 to 0.005 f/cc), 44 were on-site or at the perimeter (<0.0005 to 0.0029 f/cc), 2 were in the nearby town (0.0005 to 0.005 f/cc) and 11 were ABS (0.0029 to 0.076 f/cc). Health threats from asbestos exposure are generally presented in terms of cancer risk since limited information is available to quantify non-cancer risks from asbestos.

3.0 ROSTER OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS

This section describes the roles, names and contact information of the primary agencies, organizations, and key individuals involved in Phase I of the Removal Action, and illustrates the organization of the response.

3.1 FEDERAL AGENCIES

Environmental Protection Agency (EPA)

EPA is the lead agency. On-Scene Coordinator (OSC) Eduardo Rovira, Jr. is the project manager for the site. OSC Jack Kelly (member of the TRW) dealt with the air sampling methods, lab analysis and interpretation. EPA toxicologist Dawn Ioven provided the risk calculations.

Larry Johnson was the Community Involvement Coordinator (CIC) from the beginning of Phase I until November 2008, when Francisco J. Cruz took over as CIC. Megan Mackey was the State Liaison during the Phase I activities and kept all the elected officials informed of site activities.

Phil Campagna, with EPA's Environmental Response Team (ERT), managed the air monitoring and sampling contract and James Wright is the EPA's assigned field accountant for the site.

Agency for Toxic Substances and Disease Registry (ATSDR)

Senior Regional Representative Lora Werner, and toxicologist Karl Markiewicz, assisted the OSCs with the asbestos sampling methods, lab analysis and interpretation.

Army Corps of Engineers (USACE)

USACE in coordination with EPA's START contractor (Tetra Tech) worked on the design and implementation of the erosion and sedimentation control design. Richard DePasquale was the engineer assigned to the site.

3.2 STATE AND LOCAL AGENCIES

Pennsylvania Department of Health (PADOH)

Montgomery County Health Department (MCHD)

During the Phase I activities, under a Cooperative Agreement with the ATSDR, PADOH prepared a Health Outcome Data Evaluation to address community health concerns of perceived elevated rates of asbestos-related diseases possibly associated with the site. The PADOH representative assigned to BoRit is Barbara Allerton.

PADOH also reviewed a MCHD report of a separate health outcome data analysis. The difference within the two was that the PADOH document compared the data with the rest of the state of Pennsylvania and the MCHD document compared the data with the rest of the county. The MCHD representative assigned to BoRit is Harriet Morton.

Pennsylvania Department of Environmental Protection (PADEP)

Although EPA is the lead agency, the OSC has to comply with all of the state's Applicable or Relevant and Appropriate Requirements (ARARs); therefore, the OSC kept his counterparts at PADEP apprised of the activities at the site. PADEP representatives (Tim Cherry and Abdel Nassani) visited the site regularly during the Phase I activities.

Whitpain Township

All activities during Phase I took place at the park area, which the Township owns. The OSC kept in constant communication with Township officials.

3.3 EPA CONTRACTORS

WRScompass (WRS)

WRS was the main Emergency and Rapid Response Services (ERRS) contractor for the site and performed the actual implementation of the design. During the Phase I portion of the Removal Action, the following subcontractors to WRScompass conducted the tasks listed below:

- Bartlett Tree Service: removal of big trees during clearing and grubbing activities.
- County Line Fence: installation of new fence and gates at the pile area and installation of gates at the park area.
- Strobert Land Clearing: grinded vegetation from the clearing and grubbing activities.
- Miller Brothers Electric: ran power lines for the on-site trailers.
- CETCO: conducted oversight of the Geocells installation for the first week or so.
- Terra Structures: installed the Manta Ray Anchors by direct push technique.

Tetra Tech EM, Inc.

Tetra Tech, under the Superfund Technical Assessment and Response Team (START) contract, provided contractor oversight and engineering support to EPA. During the Phase I portion of the Removal Action, the following subcontractors to Tetra Tech conducted the tasks listed below:

- Whitmore and Haigh Engineering: assisted Tetra Tech in performing the design work of the erosion and sediment control (ESC) measures and producing necessary drawings for the job.
- Ludgate Engineering: performed a topographic survey for the entire site; and a post-construction survey of Phase I activities.

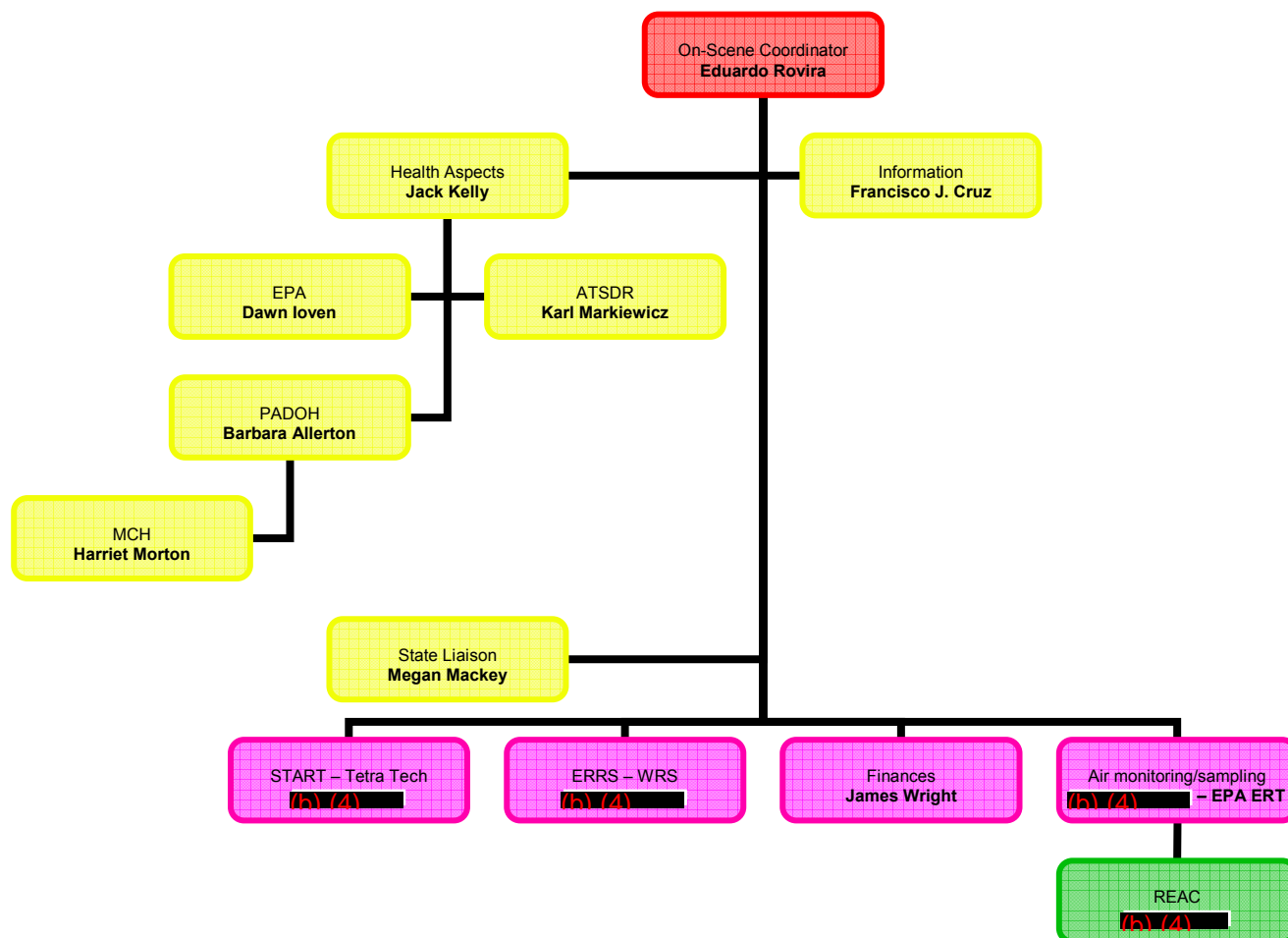
Lockheed Martin

Under the Response Engineering and Analytical Contract (REAC), Lockheed Martin conducted all the air monitoring and sampling at the site.

3.4 NAMES AND CONTACT INFORMATION

AGENCIES	CONTACTS	PHONE NUMBERS	DUTIES
U.S. Environmental Protection Agency (EPA)	Eduardo Rovira	(215) 654-5190	On-Scene Coordinator
	Jack Kelly	(215) 654-5190	On-Scene Coordinator
	Larry Johnson	(215) 814-3239	CIC (through Nov. 2008)
	Francisco J. Cruz	(215) 814-5528	CIC (Nov. 2008 to present)
	Dawn Ioven	(215) 814-3320	Toxicologist
	James Wright	(215) 814-3250	Finance
ATSDR	Lora Werner	(215) 814-3141	ATSDR Representative
	Karl Markiewicz	(215) 814-3149	ATSDR Toxicologist
Pensylvania Department of Health (PADOH)	Barbara Allerton	(717) 346-3283	PADOH Representative
Montgomery County Health Department	Harriet Morton	610-278-5117	MCHD Representative
EPA Environmental Response Team (ERT)	Philip Campagna	(732) 321-6689	Air Sampling
Lockheed Martin (REAC)	(b) (4)	(732) 494-4008	Site Lead
	(b) (4) ine	(516) 993-0400	REAC Member
	(b) (4)	(908) 812-3962	REAC Member
USACE	Richard DePasquale	(215) 656-6675	Engineer
PADEP	Abdel Nassani	(484) 250-5170	Dam Safety and Waterway Management Program
	Tim Cherry	(484) 250-5728	Environmental Cleanup Program
	Linda Rebarchak	(484) 250-5820	Community Relations Coordinator
Tetra Tech	(b) (4)	(610) 364-2126	START - Site Lead
	(b) (4)	(732) 513-0551	START Member
Whittemore and Haigh Engineering	(b) (4)	(610) 913-6820	START/ESC Design & Drafting
Ludgate Engineering	(b) (4)	(610) 404-7330	START/Site Surveys
WRScompass	(b) (4)	(215) 654-5191	Response Manager (from 09/26/08)
	(b) (4)	(215) 654-5191	RM (07/08 to 09/25/09)

3.5 ORGANIZATION OF THE RESPONSE



4.0 RESOURCES COMMITTED

This section describes the initial and additional funding requests and total costs for the Phase I activities at the site.

4.1 INITIAL FUNDING

On August 8, 2006, the EPA OSC conducted a removal site evaluation pursuant to Section 300.140 of the National Contingency Plan (NCP). On August 14, 2006, after reviewing the air sampling results collected by EPA's Site Assessment Program and evaluating factors contained in Section 300.415 of the NCP, the OSC initially determined that site conditions posed a potential significant threat to public health, welfare, or the environment and initiated immediate response activities pursuant to Section 104 of the Comprehensive Environmental Response,

Compensation and Liability Act (CERCLA) to mitigate the threat. Pursuant to Delegation of Authority 14-2, the OSC authorized the expenditure of CERCLA funding in an amount not to exceed \$250,000 to initiate an emergency removal action intended to cover exposed areas of ACM on the site surface and conduct sampling to determine the threat posed by airborne asbestos levels.

4.2 ADDITIONAL FUNDING SUMMARY

After the removal assessment was completed and the air results were analyzed, additional funds and exemption from the \$2 million and 12 months statutory limit for a removal action at the BoRit site was requested by the OSC; this request was approved by the Hazardous Site Cleanup Division Director on April 14, 2008. The figures below are actual costs from June 2008 to July 2009 (indirect costs are not included).

Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimated indirect cost for the Phase I activities is \$2,003,037.

The Phase I breakdown of costs are as follows:

EPA	\$186,629.51
ERRS	\$2,323,861.22
ESC	\$12,457.88
USACE	\$85,588.54
REAC	\$181,355.75
START	<u>\$397,897.59</u>

TOTAL: \$3,187,790.49

5.0 PHASE I DESIGN AND ACTIVITIES

5.1 EROSION & SEDIMENTATION CONTROL (ESC) DESIGN

The purpose of the stabilization of the stream banks adjacent to the site is to minimize and/or prevent the erosion along the stream banks and the resultant release of asbestos from the Site.

The design for Phase I covered an approximate length of 1,350 feet starting from the north end of the park area to the third municipal sewer manhole (as measured from the south gate by Chestnut Avenue) along Rose Valley Creek. On November 14, 2008, the final design of the ESC measures was completed and released for construction. The actual implementation of the design was started on December 31, 2008 and was completed on June 30, 2009.

The following steps were performed during the construction process:

1. After the area was cleared of vegetation and the ACM debris was picked up, the surface was covered with about 3 inches of clean fill to prepare a relatively level surface to be able to implement the design.
2. Once the clean fill had been placed on the slope, a layer of a 10 ounce non-woven geotextile fabric was laid down. The geotextile fabric was placed on the lower portion of the slope, between the 100 year flood + 1 foot elevation and the water's edge. During Phase I, approximately 8,500 yd² of geotextile fabric was installed on the slope.
3. Geocells (8 inches high) were installed along the slope over the layer of geotextile fabric. A total of approximately 7,500 yd² of Geocells were used in Phase I. The Geocells came in different length panels. All the panels were 8 feet 4 inches in width. Panels were seamed together with staples, zip ties or ATRA Keys (see appendix B for pictures). All panels were installed from the top down and kept in place with 30 inch long rebar stakes and ATRA Clips.
4. A concrete anchor (approximately 91 feet long, 2 feet wide and 2.5 feet high) was constructed at the north end of the site to act as deadweight and protect the design against any unexpected surge of water coming from upstream during a storm event.
5. The Geocells were filled with topsoil and an additional 4 inches were put on top. Topsoil was selected to fill the Geocells to provide a good medium for the vegetation to grow and further stabilize the slope.

6. As a protection against sliding, 560 MR-4 Manta Ray anchors (see appendix B for picture) were installed to secure the Geocells with 0.625 inches width Kevlar Tendon (see appendix B for picture). Also, as a secondary protection against sliding, 30 inches long (0.5 inches diameter) reinforcement bar was utilized along the slope. They were installed every fifth cell going down the slope.
7. The lower six feet of the Geocells (closest to the water's edge) were filled with #57 stone (aggregate ranging from .19 to 1.0 inches) before placement of the riprap over it. Along the edge of the creek, a 13 feet wide section of R5 riprap (rocks ranging from 9 to 18 inches) was placed as protection against a surge of fast running storm water.

Once everything was in place, the entire slope was hydroseeded and then an erosion and sedimentation control mat was placed along the slope to protect the seed from adverse weather conditions and to create a moist environment underneath, for best germination of the seeds.

Since its completion, the Phase I design has been tested several times and no evidence of real impacts along the Phase I section has been observed. Based on the precipitation (approximately 4 inches in 24 hours) and the water level on the Wissahickon and Rose Valley Creeks, the storm events could be compared to the projected 25-year flood stage, possibly even a higher stage. All the R5 riprap along the slope was under water and the debris line left on the slope was about two feet over it. Even with storms of that magnitude, the R5 riprap was still in place and there were no visible erosion channels along the slope.

Site Preparation

Access Road Constructed	2,000 yards (yd)
Clearing and grubbing	8,400 yd ²
Woven geotextile*	12,000 yd ²

Implementation of the ESC design

10 oz. non-woven geotextile **	8,500 yd ²
Geocells ***	7,500 yd ²
MR-4 Manta Ray Anchor	560
30" long rebar (0.5" diameter)	8,736
30" long rebar (1.0" diameter)	67
R5 Riprap	2,019 tons
Kevlar Tendon (0.625" wide)	24 rolls
# 57 Stone	1,114 tons

2RC Stone	1,850 tons
Clean Fill	1,840 yd ³
Top Soil	4,920 yd ³
Mushroom Soil	540 yd ³
Erosion Control Mat ****	8,200 yd ²

Note: All figures are close approximations of the actual quantities used.

* Mirafi 500x – used below the road surface.

** Along the slope, from the water's edge to the 100 year flood elevation + 1 foot.

*** Presto Geoweb slope protection system (GW20V, 8 inches high).

**** Placed on the slope after the hydroseeding was done.

5.2 CHRONOLOGY OF FIELD ACTIVITIES

May 2008 to September 2008

During the week of May 19, 2008, a boundary survey of the entire site was performed. A site kick-off meeting was held on July 7, 2008.

From July to September, ERRS cleared some vegetation and constructed access roads. A fence contractor replaced the fence along West Maple Street (near the pile area) and installed two gates: one near the pile and one gate at the park area. REAC conducted regular air monitoring and sampling. On September 3, 2008, EPA Headquarters (HQ) proposed the BoRit site to be included on the NPL. On September 17, 2008, a tree company removed 73 large trees from the Wissahickon Creek bank adjacent to the park.

October 2008 to December 2008

The ESC design for the Wissahickon Creek bank adjacent to the park was finalized. EPA and USACE decided that the placement and installation of 8-inch high Geocells would be the best choice to stabilize and control erosion along the bank of Wissahickon Creek adjacent to the park. During this same period, ERRS continued the following site activities:

- Site clearing and grubbing, including dust suppression
 - Preparation of the area for the installation of the geotextile fabric and the Geocells.
- Activities included the collection and disposal (at an off-site location) of ACM and organic debris from the slope, and the placement of clean fill to provide a relatively level surface for the Geocells installation.

REAC continued air monitoring and air sampling. On October 2, 2008, a sample load test was performed on-site to verify the holding capacity of the proposed Manta Ray anchors. Based on the results of the load tests, the designed size of the Manta Ray anchors was increased. On November 19 and 20, 2008, the surveyors returned to the site to mark out the 100 year flood + 1 foot elevation. From December 23 through 30, 2008, excavation of a trench for a concrete anchor was performed at the north end of the park area. The purpose of the concrete anchor was to add extra weight over the Geocells to prevent them from being undermined by a potential surge of water from upstream during a storm event. The dimensions of the concrete anchor were 2 feet wide by 2.5 feet high by 91 feet long. The first Geocells section was installed on December 31, 2008.

January 2009 to March 2009

Air monitoring and sampling were suspended because of precipitation and the lack of intrusive activities at the site. ERRS continued on-site dust suppression activities whenever and wherever necessary. Geocells installation continued. Additional topographic survey (from the confluence of the Wissahickon and Rose Valley Creeks to the Butler Pike bridge) was performed from February 5 to 10, 2009. From February 9 through 18, 2009, installation of the Manta Ray anchors (by direct push) along the upper bank of the slope was completed. A total of 525 anchors were installed. A total of 45 anchors had been previously installed (by hammer attachment on backhoe) between December 29, 2008 and February 6, 2009.

April 2009 to June 2009

Implementation of the design was completed. During this period, precipitation and the lack of intrusive activities continued; therefore, no air monitoring and sampling was performed. Dust suppression activity continued on as needed basis. On April 8, 2009, the site was formally placed on the NPL. On April 23, 2009, ERRS began hydroseeding the slope from the north end of the park area toward the confluence of the Wissahickon and Rose Valley Creeks. The last Geocells section was installed on May 12, 2009. Filling of the Geocells with topsoil, hydroseeding and placement of the erosion control mats continued. Phase I activities were completed by June 30, 2009.

5.3 DISPOSAL METHODS AND QUANTITIES REMOVED

There were a lot of ACM pieces (e.g., pipes, shingles, and tiles) along the Phase I slope. During the preparation stages of the slope, the bulk (big pieces) of the ACM debris was collected and put into roll-off containers for disposal. Based on visual inspection, the organic debris and soil that was pulled from the slope was handled as suspected ACM and was also sent to the landfill. During the Phase I activities, a total of 30 roll-off containers were sent to Modern Landfill in York, Pennsylvania. The combined weight of the 30 containers was 475.27 tons.

The combined weight of the roll-off containers is not a direct indication of the amount of asbestos waste sent to the landfill. As stated above, there were also some soil and organic material, which was treated as suspected waste, even though sampling was not performed to confirm the presence of ACM. In addition, since dust suppression was used during the collection and consolidation of the materials, everything was wet; therefore, the loads were heavier than they would have been otherwise.

6.0 CHALLENGES ENCOUNTERED

During the construction of ESC measures along the Wissahickon Creek slope adjacent to the park, the following problems were encountered.

1. Manta Ray (MR-4) anchor installation: The original design specifications had called for the installation of the anchors through the use of pilot holes; however, it was found to take too much time to install each anchor. After some research and discussions, EPA and its contractors decided that the anchors would be installed via a direct-push technique. A subcontractor came on-site and installed the anchors. Subsequent to the installation, each anchor was tested with a load of 2,200 psi pressure for a period of two minutes. If the pressure dropped by more than 200 pounds per square inch within the 2-minute timeframe, or if the rod pulled more than 18-inches out of the ground, the anchor was considered to have failed.
2. Manta Ray (MR-4) anchor failure: Approximately 21 (of 560) anchors failed the load test. Some anchors failed to hold the test pressure for the specified length of time and others broke. Each time an anchor failed or broke, the location was moved and the anchor was replaced by a new anchor that passed the load tests.

3. Reach of the excavator: Even though the contractor had a long reach excavator (60-foot arm length), placement of the R5 riprap along the edge of the creek, from the top of the bank, was a problem in some locations. As a solution, the top of the bank was extended out about 5 feet and wooden platforms were placed along the edge of the slope so the excavator could reach down to the water's edge.
4. Steep slope: The slope presented a real challenge for the crew. There were some areas in which the slope was too steep to work safely. Initially, the use of a wooden platform was attempted, but the idea was not accepted by the crew because of difficulties with mobility around the Geocells. After trying several alternatives, the crew completed the Geocells installation with the help of ropes tied at the top of the slope, which allowed the crew members sufficient mobility to move along the slope.

7.0 REFERENCES

O'Brien & Gere 2004. "Report for the Wissahickon Valley Watershed Association, Ambler, Pennsylvania." November 2004.

Tetra Tech 2006. "Trip Report, BoRit Asbestos Site, Ambler, Pennsylvania." October 2006.

U.S. Geological Survey 2008. "Streamflow Measurements for Pennsylvania: USGS 01473900 Wissahickon Creek at Fort Washington, PA." June 2008.

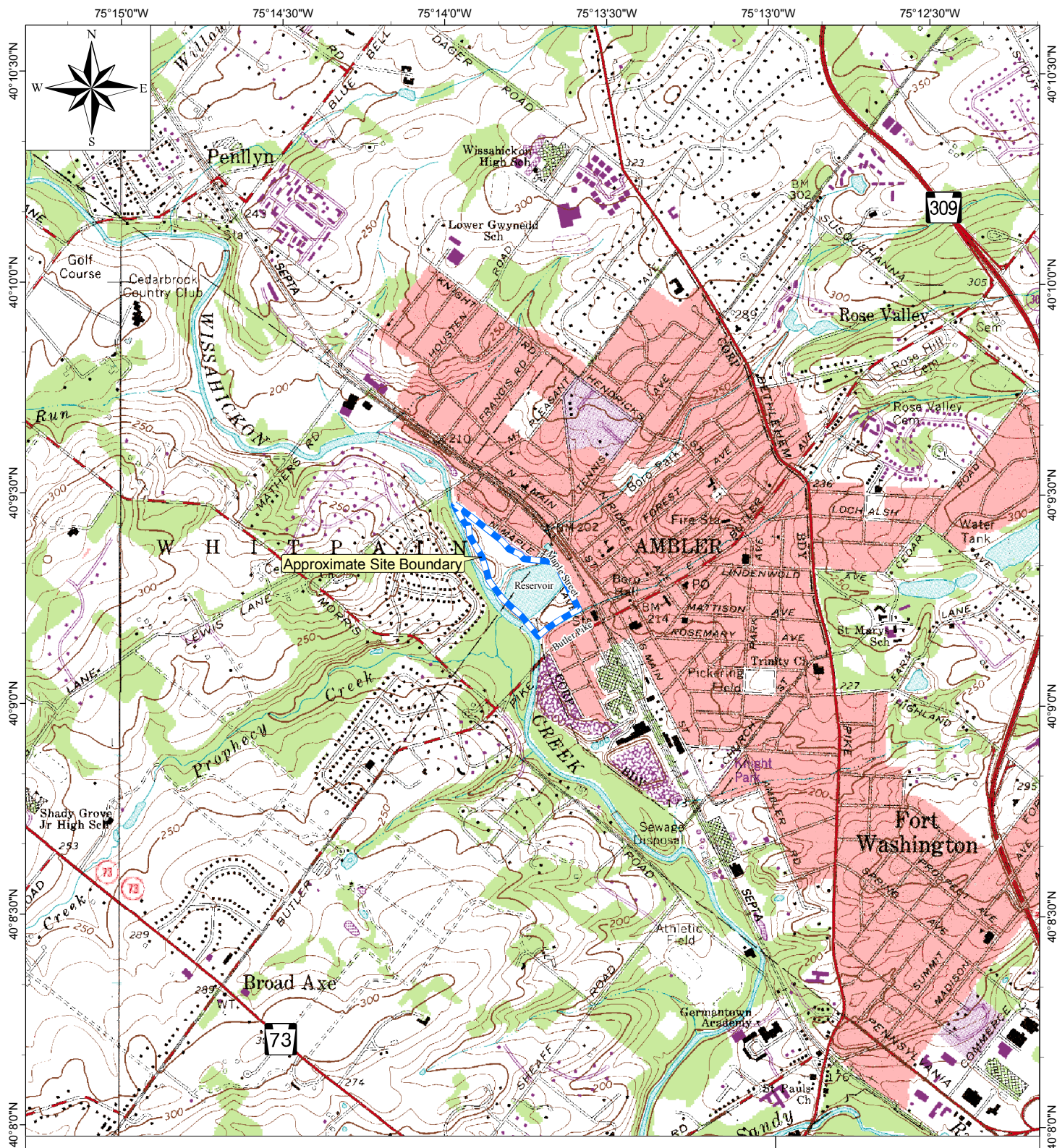
8.0 GLOSSARY OF ABBREVIATIONS AND DEFINITIONS

ABS	Activity-based sampling
ACM	Asbestos-containing material
AHERA	Asbestos Hazards Emergency Response Act
ATSDR	Agency for Toxic Substance and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
ERRS	Emergency and Rapid Response Services
ERT	Environmental Response Team
ESA	Environmental Site Assessment
ESC	Erosion and Sedimentation Control
ESC (\$\$\$)	Enforcement Support and Community Involvement Support Services
FIT	Field Investigation Team
FEMA	Federal Emergency Management Agency
HQ	Headquarters (EPA)
KMC	Keasby and Mattison Company
MCHD	Montgomery County Health Department
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PADOH	Pennsylvania Department of Health
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated biphenyls
PCM	Phase Contrast Microscopy
PCME	Phase Contrast Microscopy Equivalent

PennDOT	Pennsylvania Department of Transportation
PEL	Permissible Exposure Limits
POLREP	Pollution Report
REAC	Response Engineering and Analytical Contract
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
START	Superfund Technical Assessment and Response Team
SVOC	Semi-volatile organic compound
TDD	Technical Direction Document
TEM	Transmission Electron Microscopy
TRW	Technical Review Workgroup
TSL	Type, size, and location (survey or plan)
TWA	Time-weighted average
USEPA	U. S. Environmental Protection Agency
USACE	U. S. Army Corps of Engineers
USGS	United States Geological Survey
VOC	Volatile organic compound
WVWA	Wissahickon Valley Watershed Association
WVFP	Wissahickon Valley Waterfowl Preserve

APPENDIX A

SITE LOCATION MAP AND SITE SKETCH



Quadrangle Location = ■

Pennsylvania



BoRit Asbestos Site Ambler, Montgomery County, Pennsylvania

Figure 1
Site Location Map

TDD No. E43-026-09-07-010
EPA Contract No. EP-S3-05-02

Map created on August 19, 2009
By D. Call, Tetra Tech EMI



APPENDIX B

PHOTOGRAPHIC DOCUMENTATION LOG



PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

July 25, 2008

Orientation: East

Description:

View of the east bank of the Wissahickon Creek prior to clearing / grubbing operations.

The photograph was taken from the Whitpain Township utility (sewer) easement, located on the other side of the creek.



July 27, 2008

Orientation: Southeast

Description:

Close-up view of Asbestos-Containing Materials (ACM) exposed on the east bank of the Wissahickon Creek prior to Phase I activities.





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Client: U.S. EPA Region 3
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Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

July 27, 2008

Orientation: East/southeast

Description:

Second close-up view of ACM exposed on the east bank of the Wissahickon Creek.



July 24, 2008

Orientation: South

Description:

An excavator clearing the east bank (next to the park area) of Wissahickon Creek.





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Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

August 4, 2008

Orientation: Not Applicable

Description:

START personnel, dressed in Level C personal protective equipment (PPE), collecting soil samples along the east bank of Rose Valley Creek. The sampling location is approximately 40 feet downstream from the headwall.



August 4, 2008

Orientation: South

Description:

Emergency and Rapid Response Services (ERRS) contractor removing a stump with a chain saw along the east bank of Wissahickon Creek.





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Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

August 7, 2008

Orientation: Southwest

Description:

ERRS constructing a gravel access road along the upper bank of Rose Valley creek. Woven geotextile (Mirafi 500x) was used as the base of the road (see arrow).



August 8, 2008

Orientation: Southwest

Description:

View of the completed site access road constructed with woven geotextile and No. 57 stone.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

August 12, 2008

Orientation: Northeast

Description:

View of completed Oak Street entrance ramp.



August 11, 2008

Orientation: East

Description:

Response Engineering and Analytical Contract (REAC) contractor setting up an air monitor and a weather station on-site.





PHOTOGRAPHIC DOCUMENTATION

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Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

September 22, 2008

Orientation: South /
southeast

Description:

Bartlett Tree Clearing Company commencing the cutting / removal of trees along the east bank of Wissahickon Creek. The company removed 73 tall trees from the site.



September 23, 2008

Orientation: Southeast

Description:

View of the east bank of Wissahickon Creek after removal of large trees. Tree stumps are still visible along the bank. The creek is visible at the right corner of the photograph.





PHOTOGRAPHIC DOCUMENTATION

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Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

August 22, 2008

Orientation: West /
northwest

Description:

As part of dust suppression activities, ERRS wet down access roads with the water truck.



September 29, 2008

Orientation: Looking south /
southwest

Description:

ERRS consolidating wood debris to be ground up into wood chips.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

October 3, 2008

Orientation: East / northeast

Description:

On-site Tub Grinder machine (from Strobert Land Clearing) starting to grind up stockpiled tree trunks, limbs, etc. ERRS is on-site performing dust suppression (water spray on wood chip output from grinder) to suppress airborne dust whenever the grinder was in operation.



October 21, 2008

Orientation: East / northeast

Description:

ERRS in Level C PPE picking up exposed ACM from the east bank of Wissahickon Creek.





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Client: U.S. EPA Region 3
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Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

October 1, 2008

Orientation: Northeast

Description:

ACM debris, wrapped in plastic sheeting, staged at the former tennis court area for future disposal.



October 21, 2008

Orientation: Southeast

Description:

ERRS using a grinder attachment to reduce/level the remaining tree stumps with the surrounding slope on the east bank of the Wissahickon Creek.





PHOTOGRAPHIC DOCUMENTATION

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Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

November 20, 2008

Orientation: Southeast

Description:

ERRS is placing and compacting clean fill along the east bank of Wissahickon Creek to prepare the slope for upcoming erosion and sedimentation control activities.



November 10, 2008

Orientation: Southeast

Description:

ERRS is loading ACM debris into roll-off container for shipment to an off-site disposal facility in York, Pennsylvania.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

January 16, 2009

Orientation: Northeast

Description:

View of wooden forms for the concrete anchor at the north end of the site. The anchor acts as deadweight over the Geocells. The deadweight is required to prevent the Geocells from being undermined during a major storm event.



January 26, 2009

Orientation: Northeast

Description:

View of the completed concrete anchor prior to being covered with riprap. The Geocells around the anchor are filled with No. 57 stone before being covered with riprap and/or topsoil.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

February 2, 20019

Orientation: Northeast

Description:

View of lower portion of concrete anchor covered with riprap; the upper portion (where people are standing) was covered with topsoil.

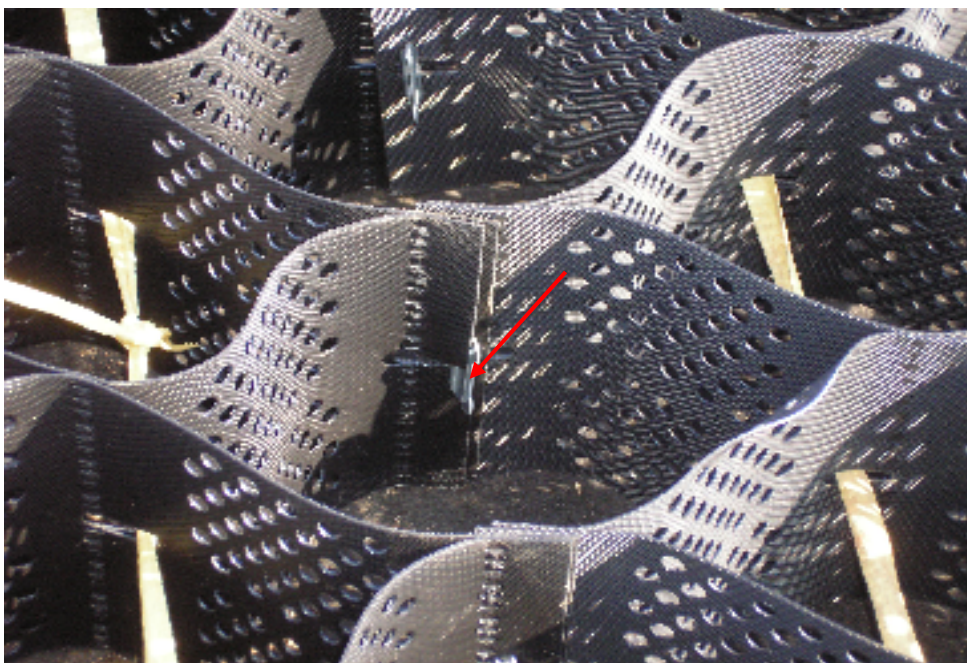


February 6, 2009

Orientation: Looking Down

Description:

Close-up view of individual Geocells. The ATRA keys (see red arrow) were used to connect adjoining sections together. The yellow Kevlar tendons are connected to anchors installed along the top of the upper bank.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

February 9, 2009

Orientation: North /
northeast

Description:

View of Geocells sections installed along the east bank of the Wissahickon Creek. Photo taken from other side of the creek.



February 23, 2009

Orientation: Northwest

Description:

View of the equipment used to install the MR-4 Manta Ray anchors. The anchors are used to tie the Kevlar tendons passing through the Geocells up the slope.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

February 24, 2009

Orientation: Not Applicable

Description:

Close-up view of the MR-4 Manta Ray anchors used to secure the Geocell sections along the slope. The rod at the top of the anchor is 6 feet long with an eyebolt at the top threaded rod; the Kevlar tendons are tied to the eyebolt and the bottom of the rod is screwed into the anchor itself.



February 24, 2009

Orientation: Not Applicable

Description:

Close-up view of the hydraulic jack used to test the anchors installed to secure the Geocells sections along the slope. If any anchor failed to pass the load test, a replacement anchor was installed.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

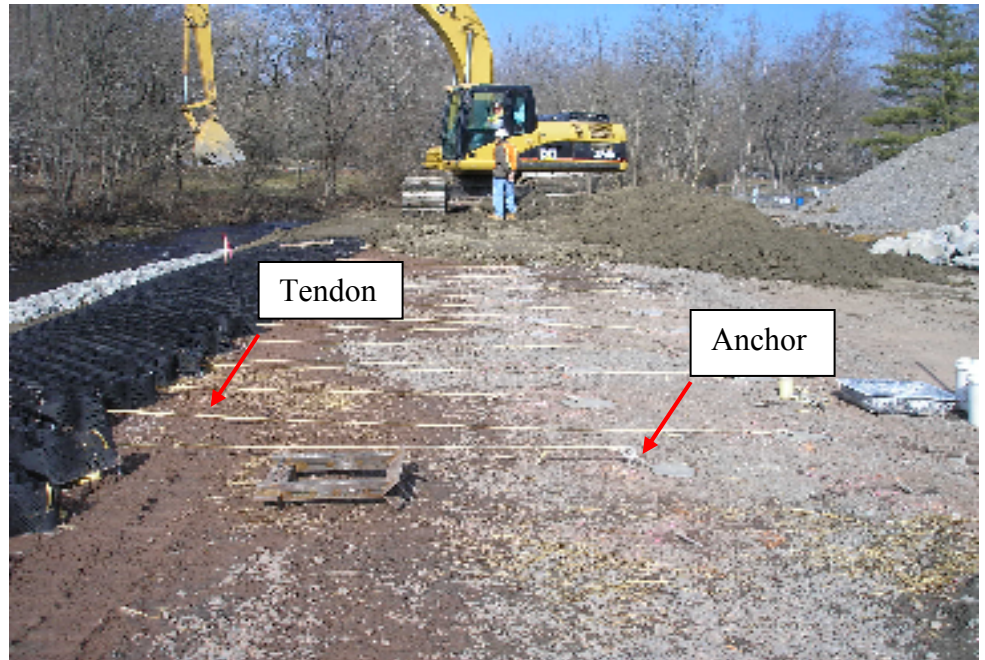
February 11, 2009

Orientation: Northwest

Description:

View of the Kevlar tendons (see arrow) from the Geocell sections secured to anchors (see arrow) that have passed the load test.

In the background, the long reach excavator can be seen filling the Geoells with topsoil.



February 6, 2009

Orientation: Northwest

Description:

View of the lower portion of the Geocells. Approximately the first 6 feet (lower portion) of the Geocells were infilled with No. 57 stone prior to covering with R5 riprap.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

April 9, 2009

Orientation: East / Northeast

Description:

Photograph taken from the easement located on the other side of the creek. ERRS is placing the 10-ounce non-woven geotextile along the slope. The geotextile is placed below the Geocells. At the left, placement of Geocells is complete.



April 9, 2009

Orientation: East / northeast

Description:

ERRS continuing to infill installed Geocell sections. Geocells were infilled with No. 57 stone at the bottom, and with topsoil to the top of the slope.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

April 24, 2009

Orientation: East / southeast

Description:

Installation of Erosion and Sedimentation Control (ESC) is complete. ERRS is hydro-seeding over the Phase I area.



April 27, 2009

Orientation: Northwest

Description:

ERRS installing erosion control mats on the slope where hydroseeding activities have been completed. The erosion control mats protect the seeds from adverse conditions and allow the seeds to germinate quickly.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

April 28, 2009

Orientation: North

Description:

ERRS is watering the slope area where hydroseeding and erosion control mat installations have been completed. Regular watering is necessary for proper vegetative growth.



May 6, 2009

Orientation: Northeast

Description:

The photograph was taken from the easement, located on the other side of the creek. One major storm event occurred in the evening on May 5, 2009. All low-lying sand bars are under water.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

May 12, 2009

Orientation: Not applicable

Description: The photograph was taken standing at the top of the park area looking towards Rose Valley Creek (visible at the top of the photograph). The Geocells were installed up to the third manhole (measured from the South gate) along the lower road adjacent to the stream.



May 29, 2009

Orientation: Northeast

Description: The former tennis court after a major storm event occurred on the night of May 28, 2009. The silt fence located north of the tennis court holding water/silt.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

May 29, 2009

Orientation: Northeast

Description:

The second silt fence located at the north end of the park area. The North gate is visible at the upper right corner of the photograph. The silt fence is holding accumulated water and silt after a heavy rain.



June 10, 2009

Orientation: Northeast

Description:

The photograph was taken from other side of the creek looking towards the south end of the park area.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

June 15, 2009

Orientation: Northeast

Description:

At the confluence of the Rose Valley and Wissahickon Creeks, the water level rose approximately 2.5 to 3 feet from the base of the Geocells area. Rising water left a debris line along the slope. The rising water caused no harm to the newly constructed slope with Geocells.



June 15, 2009

Orientation: Looking North

Description:

Due to heavy rain, the water level rose approximately 2 to 3 feet above the riprap; the debris line can be seen at the right. The Engineering Inspector for Whitpain Township (seen at left) accompanied the EPA OSC (center) to inspect the integrity of the Phase I design.





PHOTOGRAPHIC DOCUMENTATION

Client: U.S. EPA Region 3
Site Name: BoRit Asbestos Site
Location: Ambler, PA
Date: September 21, 2009

Prepared by: Tetra Tech EM, Inc.
Photographer(s): Kevin Phelan; Mrinal Biswas
TDD Number: E33-020-08-07-018

June 29, 2009

Orientation: Looking South

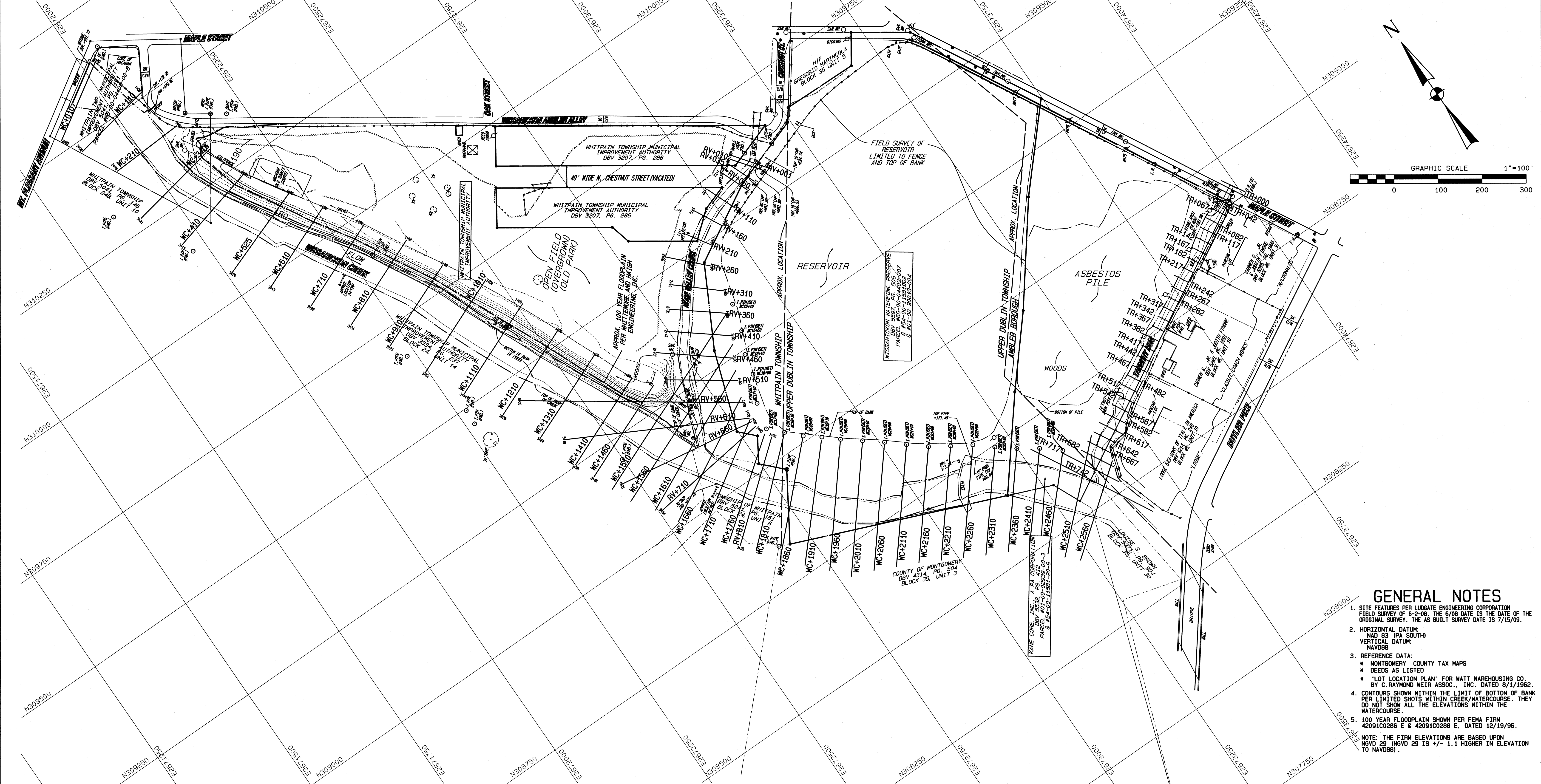
Description:

View of the completed Phase I slope. The seed mixture used on the slope was ERNST 181.



APPENDIX C

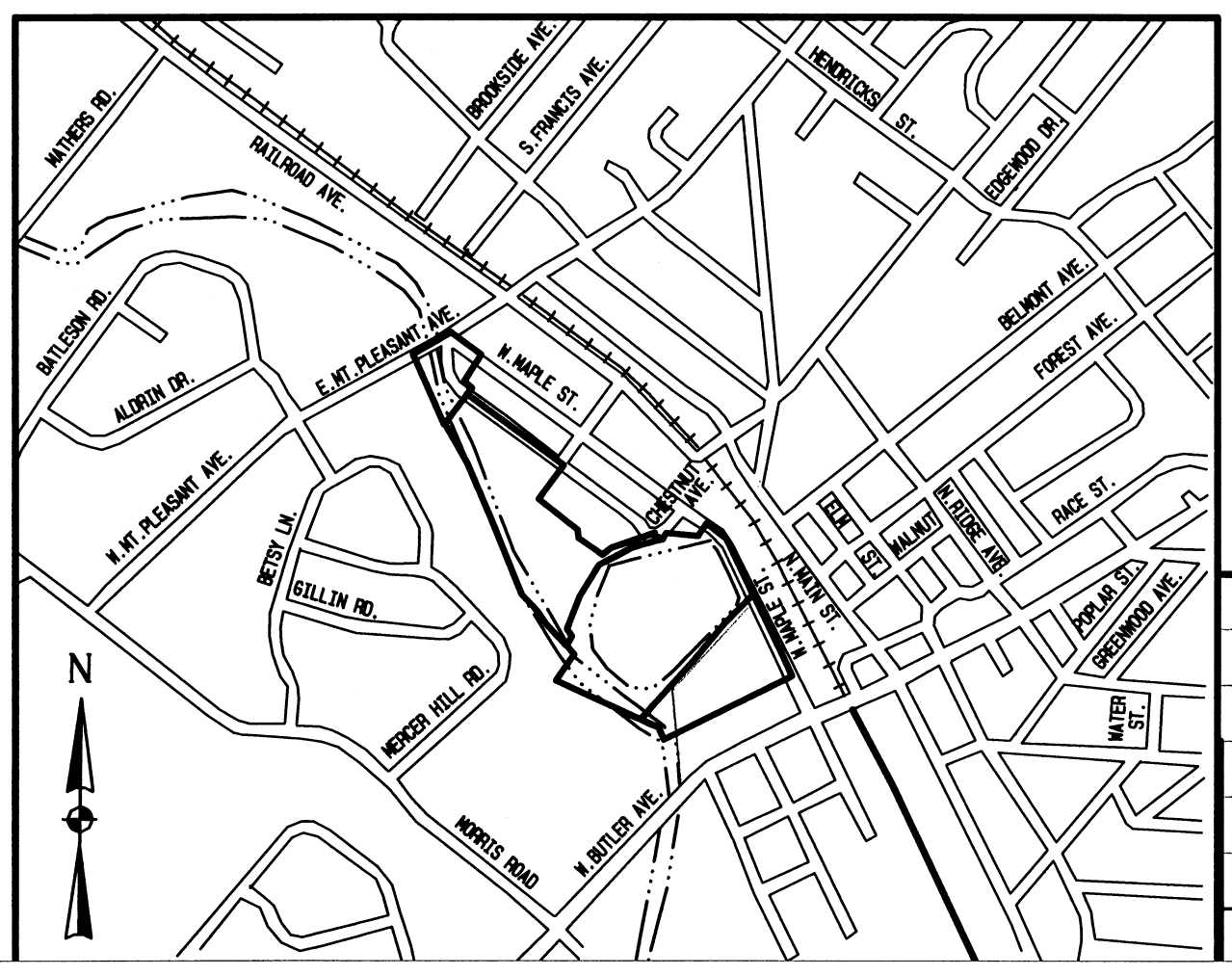
POST-CONSTRUCTION SURVEY DATA



- GENERAL NOTES**
- SITE FEATURES PER LUDGATE ENGINEERING CORPORATION FIELD SURVEY OF 6-2-08. THE 6/08 DATE IS THE DATE OF THE ORIGINAL SURVEY. THE AS BUILT SURVEY DATE IS 7/15/09.
 - HORIZONTAL DATUM:
NAD 83 (PA SOUTH)
VERTICAL DATUM:
NAVD88
 - REFERENCE DATA:
 - * MONTGOMERY COUNTY TAX MAPS
 - * DEEDS AS LISTED
 - * "LOT LOCATION PLAN" FOR MATT WAREHOUSING CO. BY C. RAYMOND WEIR ASSOC., INC. DATED 8/1/1962.
 - CONTOURS SHOWN WITHIN THE LIMIT OF BOTTOM OF BANK PER LIMITED SHOTS WITHIN CREEK/WATERCOURSE. THEY DO NOT SHOW ALL THE ELEVATIONS WITHIN THE WATERCOURSE.
 - 100 YEAR FLOODPLAIN SHOWN PER FEMA FIRM 42091C0286 E & 42091C0288 E, DATED 12/19/96.
- NOTE: THE FIRM ELEVATIONS ARE BASED UPON NGVD 29 (NGVD 29 IS +/- 1.1 HIGHER IN ELEVATION TO NAVD88).

- LEGEND**
- = MONUMENT FOUND
 - = CATCH BASIN (C.B.)
 - = SANITARY OR STORM MANHOLES (AS INDICATED)
 - = WATER VALVE CAP
 - ⊙ = GAS VALVE
 - = UTILITY POLE W/GUY WIRE
 - ⊕ = FIRE HYDRANT
 - ⊙ = STREET SIGN (AS NOTED)
 - ☼ = EXISTING TREES
 - = WOODS LINE
 - = EXIST. FENCE LINE
 - ▭ = EXISTING BUILDINGS

LOCATION MAP
SCALE: 1"=1000'



SHEET INDEX

OVERVIEW TOPOGRAPHIC SURVEY PLAT			SHEET 1 OF 8
TANNERY RUN DETAIL VIEW			SHEET 2 OF 8
ROSE VALLEY DETAIL VIEW			SHEET 3 OF 8
CROSS SECTION PROFILES			SHEETS 4, 5, 6, 7, 8 OF 8
#6 PSR	7-21-09	ASBUILTS	
#5 PSR	2-13-09		
#4 PSR	1-5-09		
#3 PSR	8-19-08		
#2 PSR	8-15-08	ADD SECTIONS	
#1 PSR	6-16-08		
REVISION	DATE	DESCRIPTION	

**OVERVIEW
TOPOGRAPHIC SURVEY PLAT**

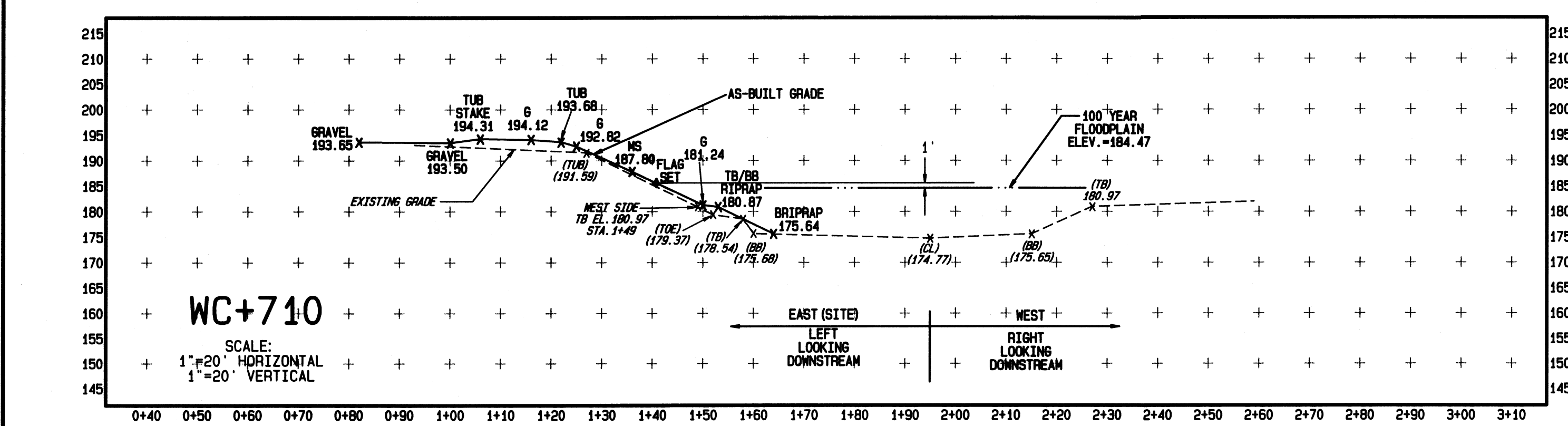
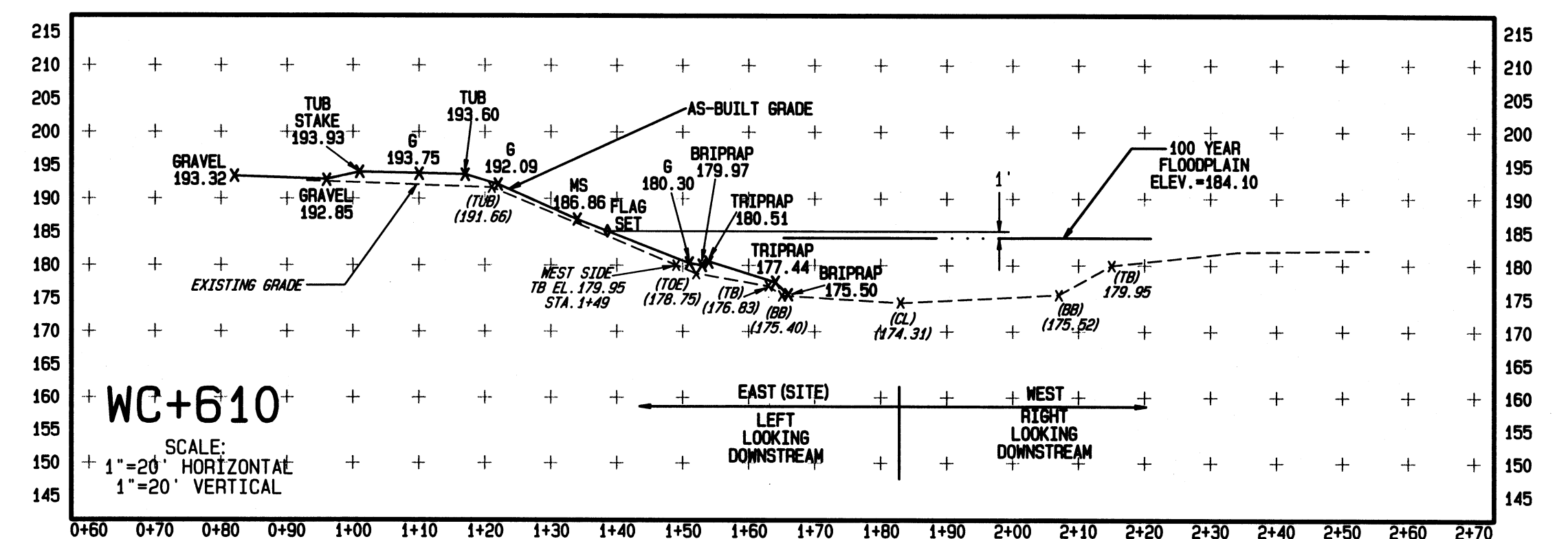
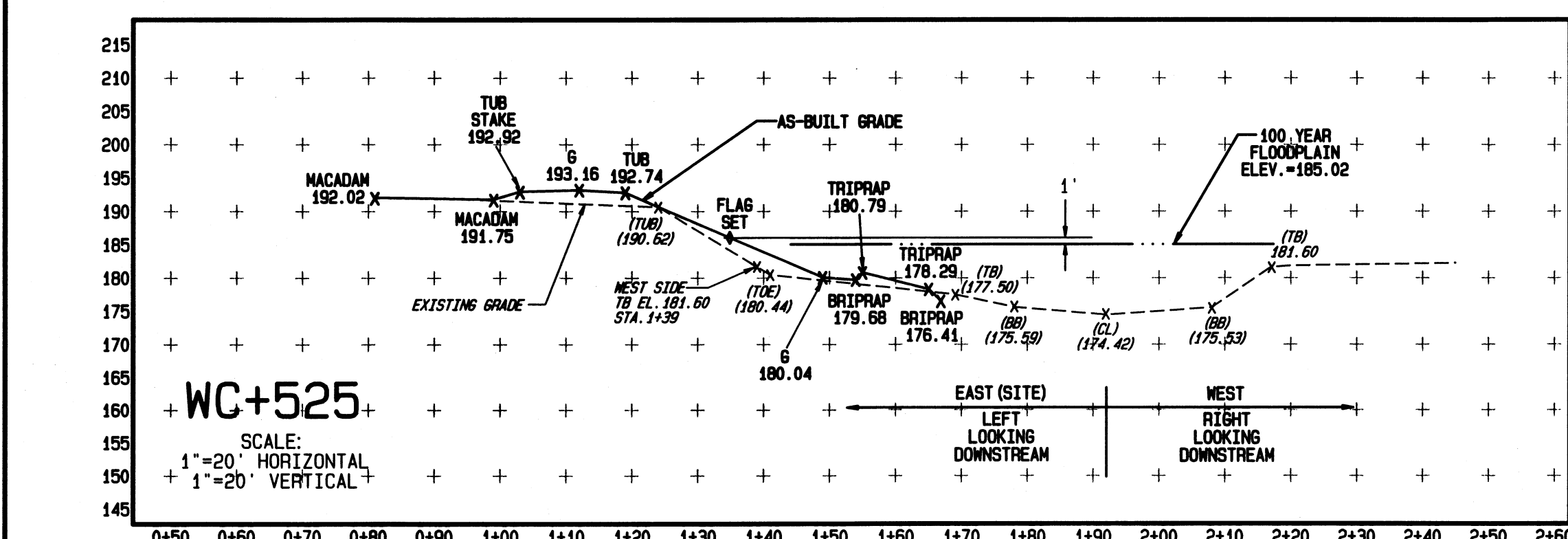
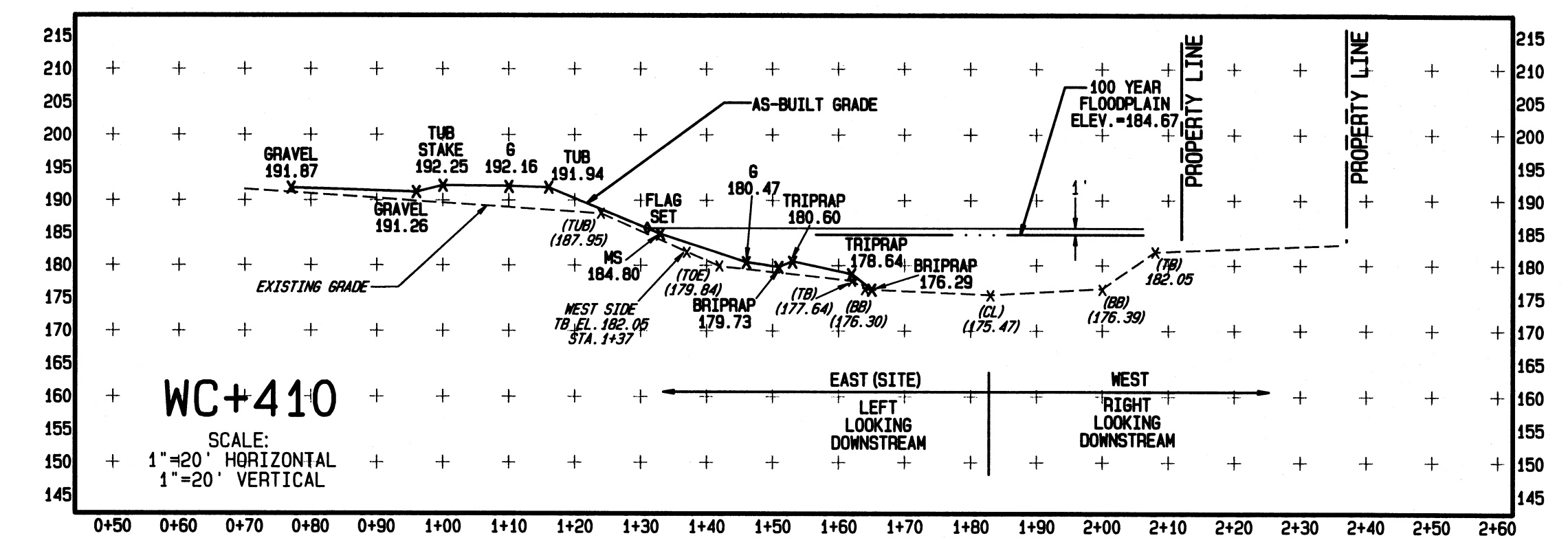
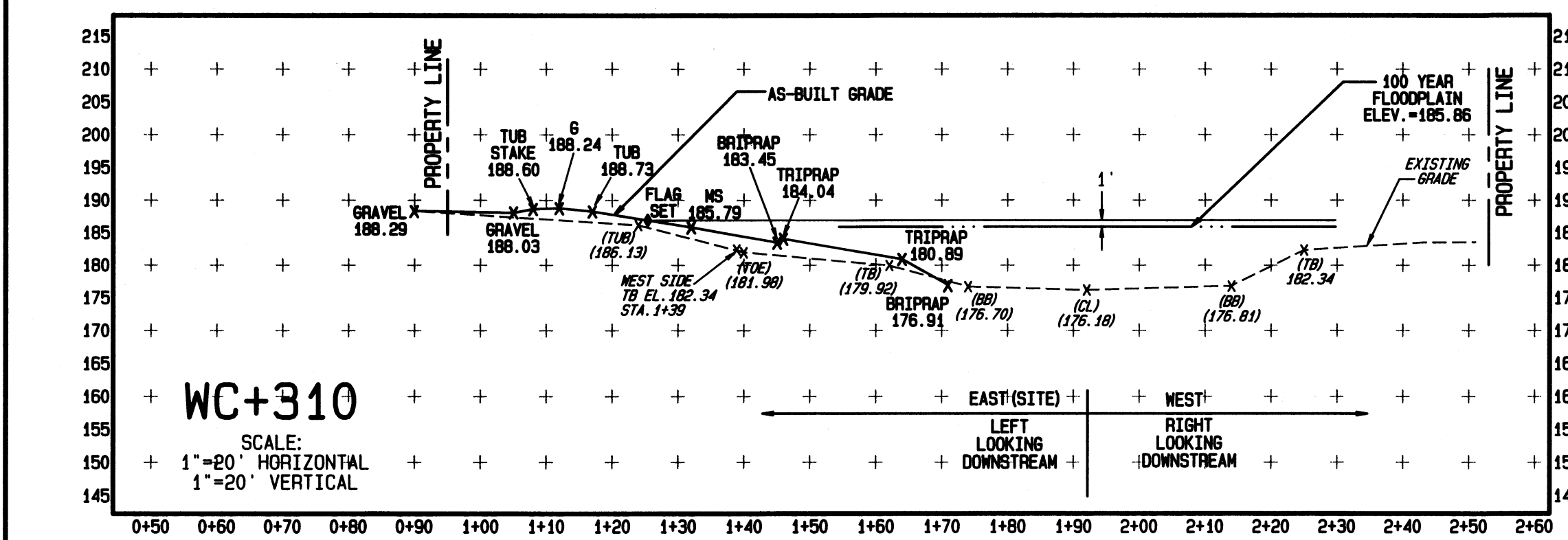
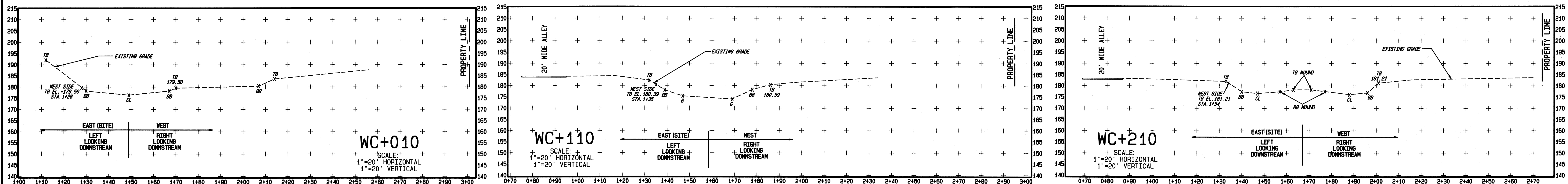
TTEMI: BORIT ASBESTOS PILE

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ENGINEERS SURVEYORS PLANNERS
ENVIRONMENTAL SCIENTISTS
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LINCOLN CORPORATE CENTER
10 VANGUARD DRIVE, SUITE 90
READING, PA 19606
PHONE 610-404-7330
FAX 610-404-7371

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DRAWN PSR	COMP (BNDY) 6-5-08	COMP (LOT) SCALE	PA ONE CALL DATE	COMPUTER FILE P: 7801508.PRO
SCALE 1"=100'	TAX MAP PARCEL SEE ABOVE	DRAWING NUMBER D-7801508 SHT. 1 OF 8		



CROSS SECTION PROFILES

SITUATE IN:
UPPER DUBLIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

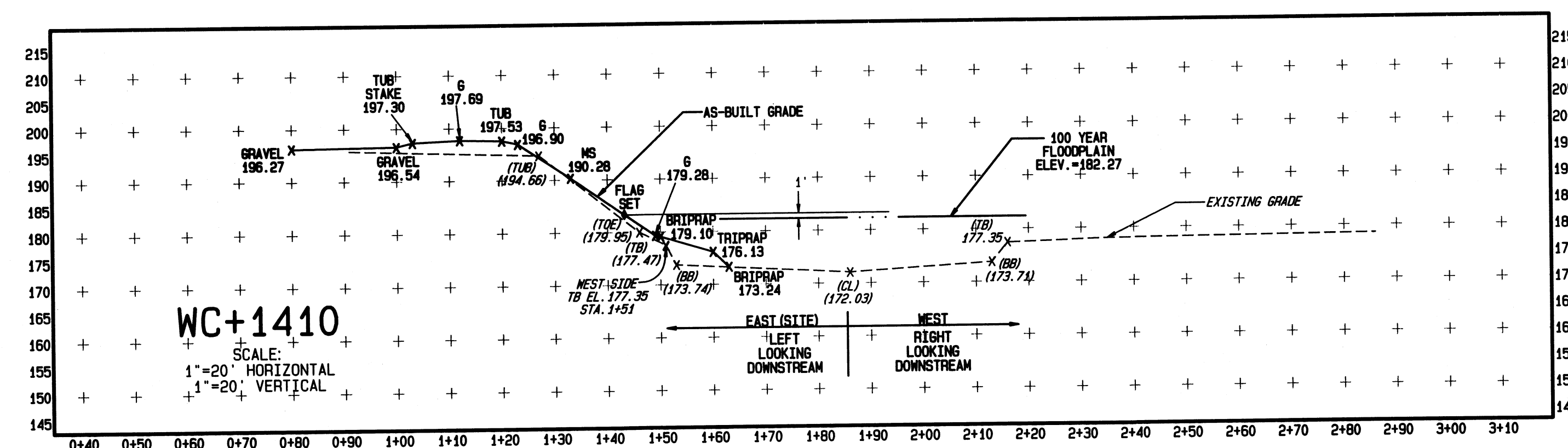
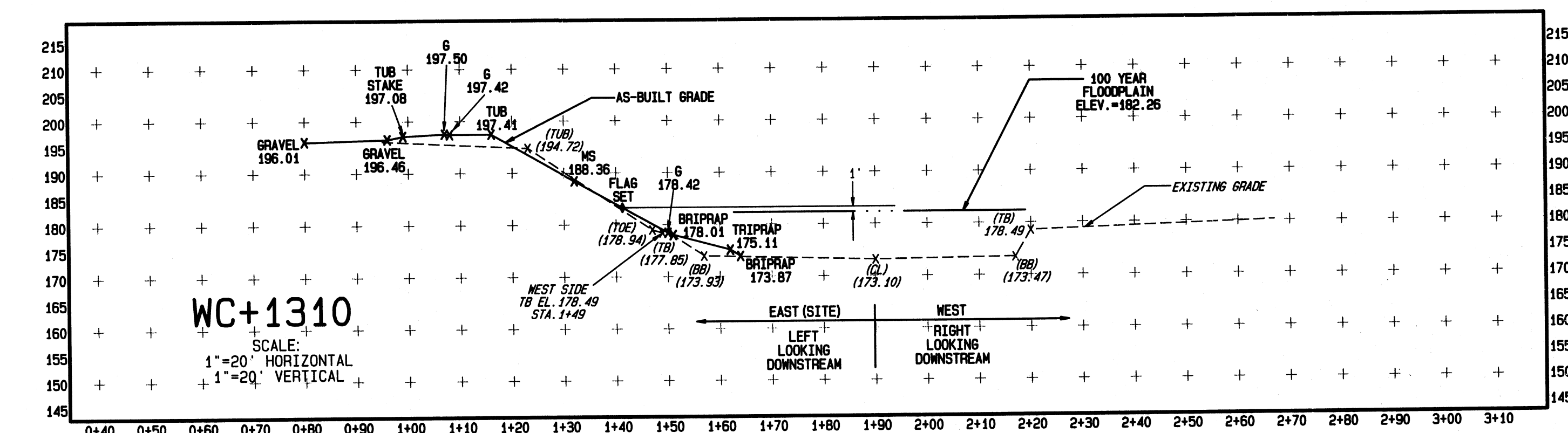
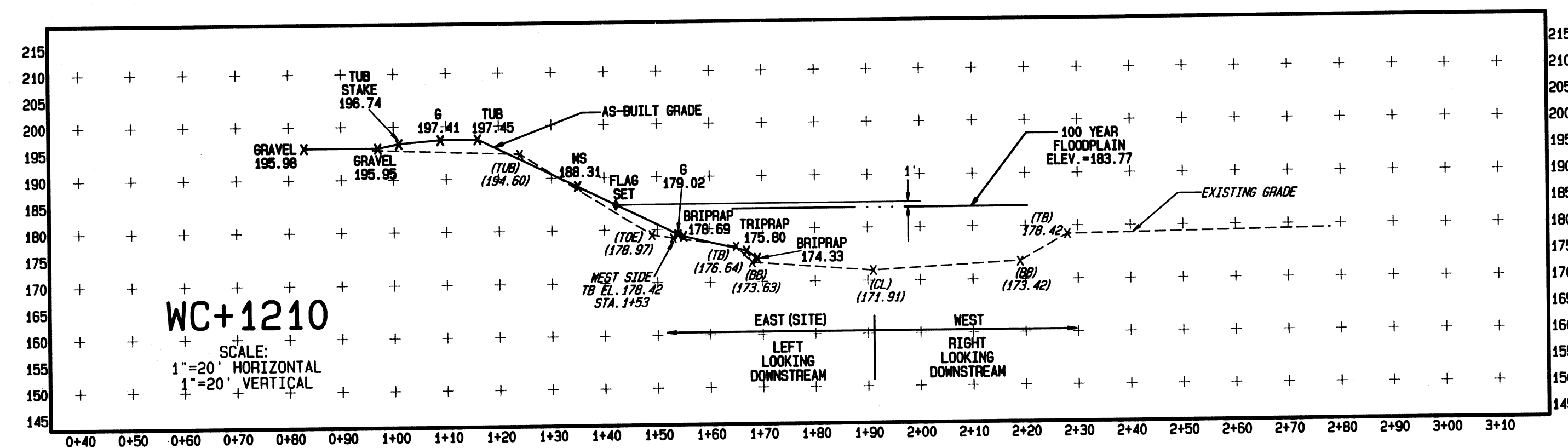
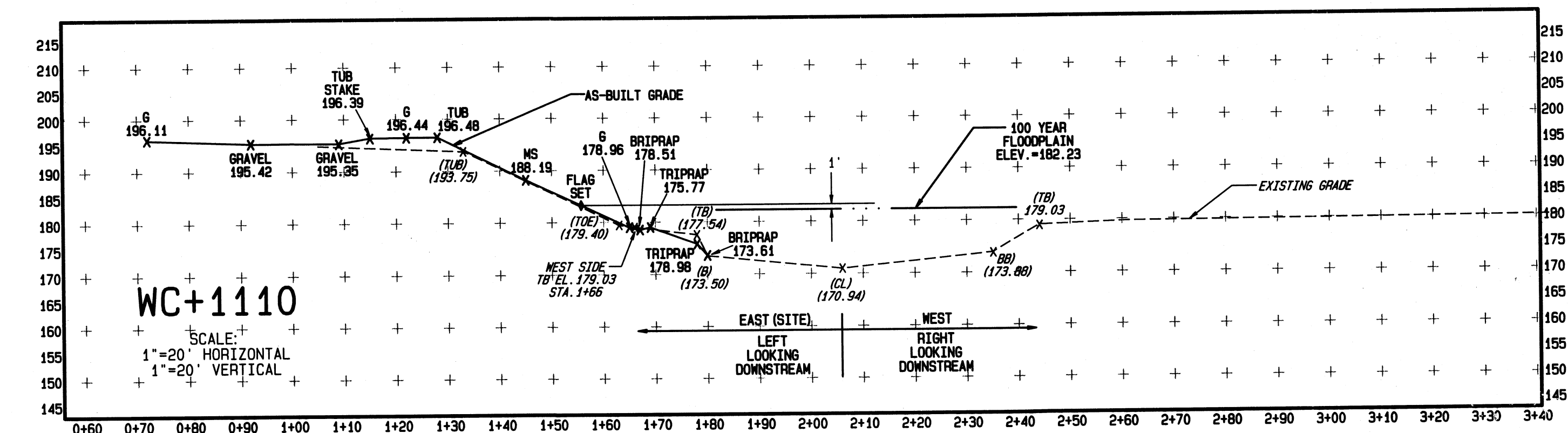
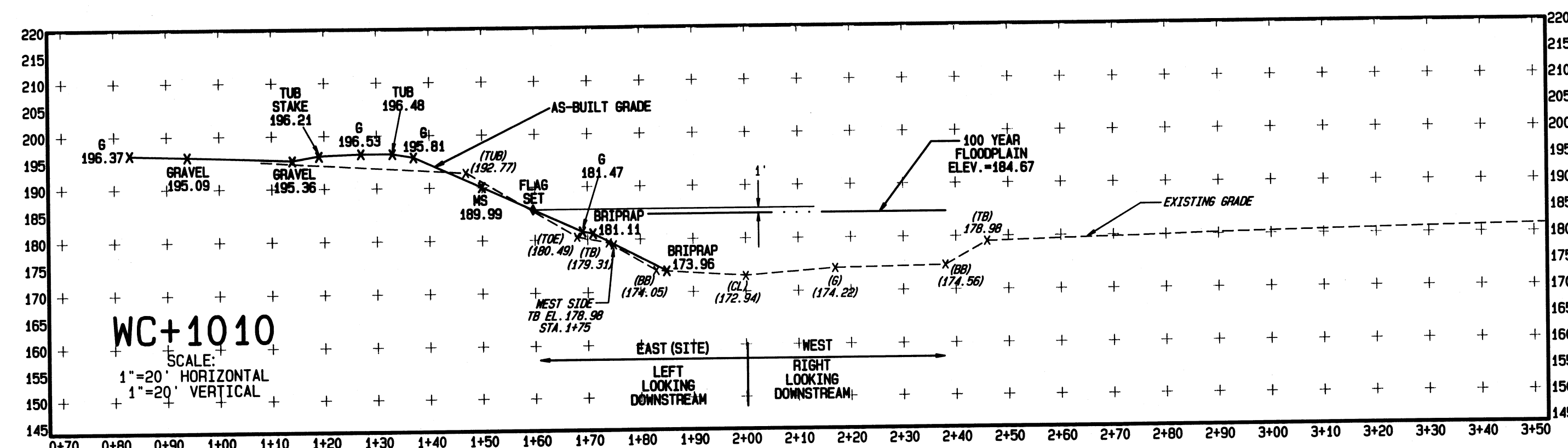
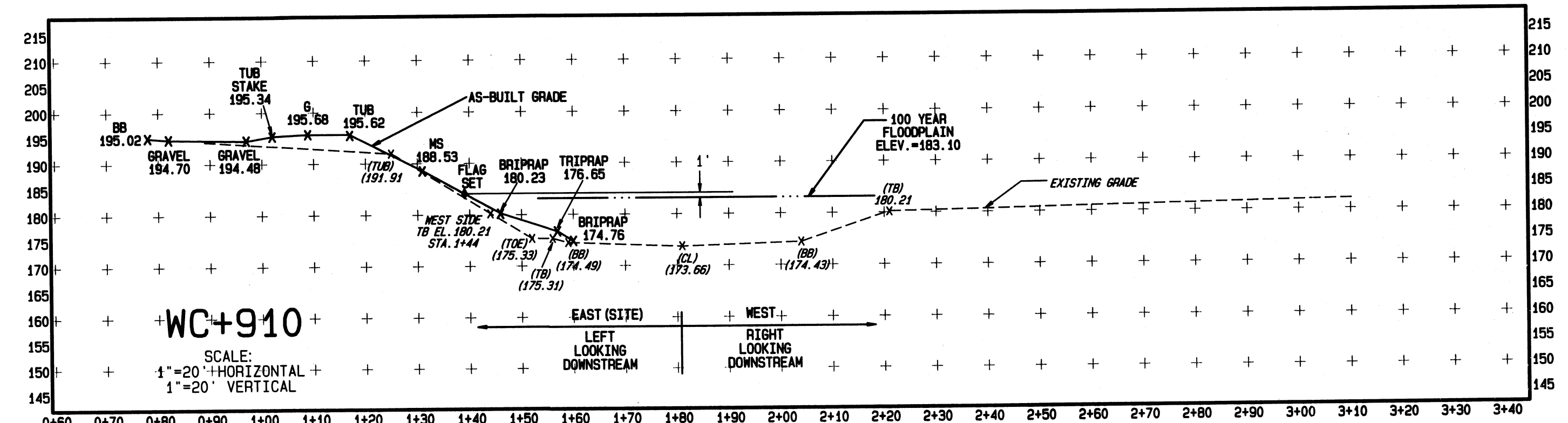
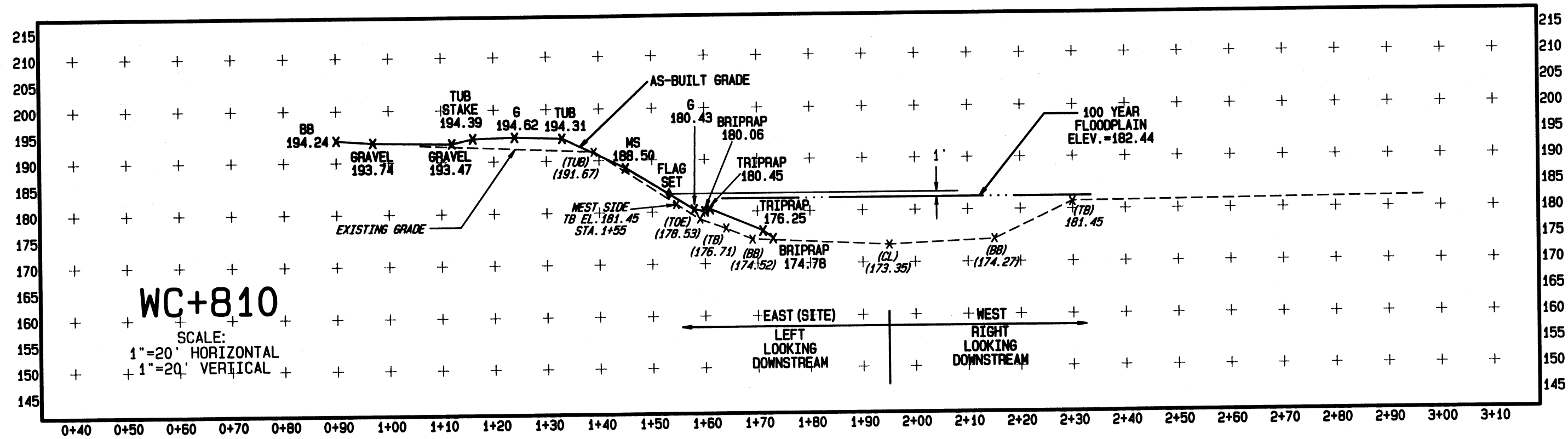
TTEM1: BORIT ASBESTOS PILE

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READING, PA 19606
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AS NOTED	SEE ABOVE			D-7801508 SHEET 4																						

#3 PSR	7-21-09	AS-BUILTS
#2 PSR	1-5-09	
#1 PSR	8-19-08	
REVISION	DATE	DESCRIPTION



CROSS SECTION PROFILES

SITUATE IN:
UPPER DUBLIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

ITEM: BORIT ASBESTOS PILE

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10 VANGUARD DRIVE, SUITE 90
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DRAWN PSR	COMP (BNDY) 2-13-09	COMP (LOTIS) TAX MAP PARCEL	PA ONE CALL DATE	COMPUTER FILE P: 7801508.PRO
SCALE AS NOTED	SEE ABOVE	DRAWING NUMBER D-7801508 SHEET 5		

#3 PSR	7-21-09	ASBUILTS
#2 PSR	1-5-09	
#1 PSR	8-19-08	
REVISION	DATE	DESCRIPTION